
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA CORRECTIVE ACTION ENVIRONMENTAL INDICATOR (EI) RCRAInfo CODE (CA725) CURRENT HUMAN EXPOSURES UNDER CONTROL

Facility Name: Chevron Chemical (Former Ortho Products Facility)
Facility Address: 800 Metuchen Road; South Plainfield, New Jersey
Facility EPA ID#: NJD002171593

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the Resource Conservation and Recovery Act (RCRA) Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) to track changes in the quality of the environment. The two EIs developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of “Current Human Exposures Under Control” EI

A positive “Current Human Exposures Under Control” EI determination (“YE” status code) indicates that there are no unacceptable human exposures to “contamination” (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While final remedies remain the long-term objectives of the RCRA Corrective Action program, the EIs are near-term objectives, which are currently being used as program measures for the Government Performance and Results Act of 1993 (GPRA). The “Current Human Exposures Under Control” EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program’s overall mission to protect human health and the environment requires that final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration/Applicability of EI Determinations

EI determination status codes should remain in the Resource Conservation and Recovery Act Information (RCRAInfo) national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).



Facility Information

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from solid waste management units (SWMUs), regulated units (RUs), and areas of concern (AOCs)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter IN (more information needed) status code

References

See under Question #2.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated” above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Organochlorine Pesticides (OCPs), Volatile Organic Compounds (VOCs), metals
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)	X			OCPs, VOCs, metals
Surface Water		X		OCPs
Sediment	X			OCPs
Subsurface Soil (e.g., >2 ft)	X			OCPs, VOCs, metals
Air (Outdoor)		X		

_____ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

 X If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter IN status code.

Rationale

The Former Ortho Products Facility (Site) is situated on a 19-acre parcel of land at the corner of Metuchen Road and Harmich Road in South Plainfield, Middlesex County, New Jersey. Figure A-1 presents a Site location map. Metuchen Road bounds the property to the southwest, Harmich Road to the northwest, and Consolidated Rail Corporation (Conrail) Railroad Spurs to the southeast (Railroad Spur B) and northeast (Railroad Spur A). Two industrial facilities abut the Conrail spur to the northeast, the Hummel Chemical Company (Hummel) and the United Steel Deck (USD) Company. Figure A-2 presents a map of the Site and the surrounding properties.

The Site was operated by Ortho Products from 1952 to 1985. The operations consisted of formulation and distribution of consumer and agricultural products including pesticides. Prior to development by Ortho, the Site

¹ “Contamination” and “contaminated” describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

was used as a rail yard. Site improvements include a warehouse building which is unused, with the exception of one area which houses a mothballed groundwater treatment facility. Additionally, there are paved parking lot areas.

The Hummel property is located to the northeast of the Site. The Hummel facility was used to formulate household cleaning items from 1958 to 1968 and inorganic chemical products after 1968. Prior to 1958, the Site was used as a distribution and storage area for coal by the Lehigh Valley Railroad. The Hummel property is 2.5 acres with one acre paved or covered by buildings.

The USD property is located to the northeast of the Site. The USD property is 11 acres with a 3.3-acre building and a 0.4 acre stormwater retention pond in the southeastern portion. Approximately 9 acres of the 11-acre USD property is covered with impervious surface (asphalt paving, concrete paving, or manufacturing buildings). Stormwater is collected from the impervious surface and conveyed to the stormwater retention pond. Episodic precipitation events result in discharge of the retention pond into a channel that traverses the Site.

The Abramson property is a 15-acre property located southeast of the Site within the Borough of South Plainfield and Edison Township, New Jersey. **Historical maps and aerial photographs show that the property has remained undeveloped through the present. Absence of development since possible prior agricultural use is related to the ecological setting (forested** wetlands characterized by episodic inundation by surface water during storm events). The Site and the Abramson property are separated by Railroad Spur B.

Stormwater and surfacewater runoff from the Site and other surrounding properties flows through wetlands on the Abramson Property to a culvert which conveys flow beneath roads and railroad tracks to a culvert channel and ultimately discharges to an Unnamed Tributary to the Bound Brook.

The Unnamed Tributary and Culvert Channel are located south of the Site. The Culvert Channel flows approximately 300 feet downstream from the Metuchen Road and Lehigh Valley Culverts to the confluence with the Unnamed Tributary. The Unnamed Tributary flows to the west from this confluence for approximately 900 feet to the confluence with Bound Brook.

Groundwater

Groundwater impacts are primarily related to historical Site operations and are generally limited to the boundaries of the Site. Groundwater impacts are generally coincident with former source areas. Groundwater analytical results indicate the presence of constituents of concern (COCs) within the following three groups:

- OCPs;
- VOCs; and
- Metals.

For ease of presentation, groundwater impacts will be discussed according to the Site COCs discussed above. Results of groundwater investigations at the Site are presented in the groundwater reports listed in the references section. A summary of recent groundwater analytical results is included as Table B-1 (OCPs and metals) and B-2 (VOCs).

A figure illustrating the horizontal extent of groundwater impacts at the Site has been included as Figure B-1.

Vertical delineation of groundwater was completed by the installation of two deep wells on the former Ortho Products facility, P-3D and P-12D. These wells were sampled for four quarters, and the analytical results are included in Table B-3.

OCPs

OCPs detected at concentrations greater than the New Jersey Department of Environmental Protection (NJDEP) Groundwater Quality Standards (GWQS) include aldrin, alpha-benzene hexachloride (alpha-BHC), beta-BHC, gamma-BHC, chlordane, 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDD), 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT), dieldrin, endosulfan I, endosulfan sulfate, endrin, and heptachlor. Groundwater OCP impacts are generally limited to wells located within onsite property boundaries with the exception of wells MR-1 and MR-2 which are located across Metuchen Road on the western boundary and wells MW-1, MW-2, MW-4, MW-5, MW-8, and MW-9 located at the adjacent Hummel facility. Highest concentrations of OCPs are generally detected within or adjacent to the former loading/storage area and within the footprint of the former rinsate pond.

VOCs

VOCs detected at concentrations greater than the GWQS include benzene, chlorobenzene, ethylbenzene, and total xylenes. Groundwater VOC impacts are limited in extent and are located within onsite property boundaries with the exception of one detection of benzene (2.3 ug/l) slightly greater than the GWQS (1 ug/l) in well MW-6 located on the Hummel property. Highest concentrations of VOCs are generally detected within or adjacent to the former loading/storage area.

Metals

Metals impacts are limited to arsenic. Arsenic impacts to groundwater are spatially discontinuous and are limited in extent. Arsenic has been detected at a concentration greater than the GWQS in wells DSW-2, DSW-9, P-1, P-2, P-7, P-11, P-12, P-13, P-19, P-20, and SSW-2.

Air (Indoors)

There are no active/occupied buildings on the former Ortho Products facility, or on adjacent properties with site-related impacts to groundwater. The closest active/occupied buildings are on the Hummel facility, but they are over 100 feet from site monitoring wells. The closest monitoring well on the Chevron property that is monitored for VOCs is monitoring well P-9. Concentrations of VOCs in P-9 have been below EPA screening values, as shown on Table C-1.

Constituents found in subsurface soil do not meet the United States Environmental Protection Agency (USEPA); volatilization requirements (USEPA, 1991) for both the Henry's Law constant (greater than or equal to 1×10^{-5} atmospheres-cubic meters per mole (atm-m³/mol) and molecular weight (less than 200 grams per mole[g/mol]). Soil impacts are not expected to volatilize substantially; therefore, indoor air is not considered to be an impacted media.

Surface/Subsurface Soil

Surface and subsurface soil impacts have been horizontally and vertically delineated on the former Ortho Products facility and on the Hummel, USD, Railroad Spur A, and Abramson properties. Soil analytical results indicate the presence of COCs within the following four groups:

- OCPs;
- VOCs;
- total petroleum hydrocarbons (TPH); and
- Metals.

OCPs detected at concentrations greater than the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) include aldrin, alpha-BHC, beta-BHC, gamma-BHC, chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, endrin, heptachlor, heptachlor epoxide, methoxychlor, and toxaphene. The only VOC detected at a concentration greater than the RDCSCC is total xylenes. Metals historically detected in soil at concentrations greater than the RDCSCC include arsenic and mercury.

For ease of presentation, each area is discussed in detail below.

Site

Soil investigation and remediation activities were performed in two phases between 1989 and 1994. The first phase, 1989 through 1990, addressed eight areas of concern (AOC). The second phase, 1992 through 1993, included grid sampling of the entire Site and additional sampling on an AOC-basis. These investigations focused on the following areas:

- SCOPE™ Burial Areas No. 1 and 2;
- Railroad Spur Area;
- Compressor Blowdown Area;
- Drainage Ditch;
- Rinsate Pond;
- Incinerator Pad;
- Drum Storage Area;
- Septic Tank Lateral Field; and
- Truck Loading/Off Loading and Storage Area.

Many samples were taken from Site AOCs and more than 13,000 tons of soil were excavated, however the horizontal and vertical limits of the COCs in soil in some areas remained unresolved. A Supplemental Remedial Investigation (SRI) for onsite soils was conducted from September 2001 to January 2002 to complete delineation of COCs detected in previous investigations. Horizontal delineation sampling was conducted along the perimeter of the Site. Vertical delineation sampling was conducted where previous sampling did not achieve vertical delineation and in select locations in former source areas.

Additional SRI soil sampling was conducted from January to March 2003 to complete horizontal and vertical delineation due to a lower RDCSCC for chlordane established by the NJDEP in a letter dated October 10, 2002. Horizontal and vertical delineation was achieved as a result of the SRI activities.

Horizontal delineation of onsite soil impacts is complete at the surface (0 to 0.5 foot below ground surface [bgs]) to the southwest and northwest along Metuchen Road and Harmich Road, respectively. Horizontal delineation is achieved along Harmich Roads at all locations within 10 feet of the onsite property boundary. Horizontal delineation along Metuchen Road extends no greater than 23 feet beyond the property boundary. Horizontal delineation along the southeastern property boundary, which includes Railroad Spur B, is complete with the exception of areas where surface impacts continue onto the Abramson property. Impacts at the Abramson property are addressed below in the Abramson property section. Horizontal delineation along the northeastern property boundary is addressed in the Railroad Spur A section.

Vertical delineation of onsite soil impacts is complete. Vertical delineation to RDCSCC for all OCPs was completed at depths ranging from 6.5 to 24 feet bgs. The depth of delineation is generally dependent on the existence of former source areas. Delineation is achieved at greater depths in source areas such as the drainage ditch, rinsate pond, and SCOPE™ Area No. 2.

A summary of onsite delineation activities may be found in the Supplemental Remedial Investigation Report (BBL, 2002) and the Supplemental Remedial Investigation Report Addendum (BBL, 2003). Figures D-1 and D-2 present horizontal and vertical delineation locations at the Site, respectively.

Hummel Property

In 1992, the southern portion of the Hummel property was excavated to 3 feet bgs because the soil was impacted with OCPs. Post-excavation samples were collected and analyzed for OCPs. Post-excavation samples were collected in 1995 from the previously excavated areas. All samples were analyzed for OCPs. Vertical delineation was achieved at 51 locations. In March and June of 1997, additional soil samples were collected and analyzed for OCPs. Concentrations of OCPs were below SCC, providing vertical delineation at 12 locations.

An SRI for offsite soil at the Hummel facility was conducted in August 2003 to complete delineation of COCs detected in previous investigations (OCPs). Horizontal and vertical delineation was achieved as a result of the SRI activities. Horizontal delineation on the Hummel facility was completed at the surface (0 to 0.5 feet bgs) at sample location OD-1. Vertical delineation at the Hummel facility was completed at depths ranging from 0 to 9.5 feet bgs.

A summary of delineation activities may be found in the Draft Supplemental Remedial Investigation Report/Remedial Action Selection Report for the Hummel Chemical Company (BBL, 2005). Figures D-3 and D-4 present horizontal and vertical delineation locations at the Hummel property, respectively.

USD Facility

Soil samples were collected and analyzed for OCPs in 1995 from beneath the concrete pad on the USD property in a 60- by 100-foot grid sampling pattern. In 1997, additional samples were collected from locations northeast of prior locations and along the southwest wall of the USD building. An SRI for offsite soil at the USD facility was

conducted from August to November 2003 to complete delineation of COCs detected in previous investigations. Horizontal and vertical delineation was achieved as a result of the SRI activities.

Horizontal delineation on the USD property was completed at the surface (0 to 0.5 feet bgs) within the property boundary. Vertical delineation to the RDCSCC was completed at depths ranging from 0 to 7.5 feet bgs.

A summary of delineation activities may be found in the Draft Supplemental Remedial Investigation Report/Remedial Action Selection Report for the United Steel Deck Property (BBL, 2005). Figures D-5 and D-6 present horizontal and vertical delineation locations at the USD property, respectively.

Railroad Spur A

Soil sampling was conducted in 1993, 1995, 1997 and 1998 to delineate OCP and arsenic impacted soils at Railroad Spur A. An SRI for offsite soil at the Railroad Spur A was conducted in November 2001 and August through November 2003 to complete delineation of COCs detected in previous investigations. Horizontal and vertical delineation was achieved as a result of the SRI activities. Horizontal delineation was achieved in surface soil (0 to 0.5 feet bgs) on the northwestern edge of the spur and on the adjacent USD and Hummel properties. Vertical delineation was achieved at depths ranging from 6.5 to 9.5 feet bgs.

A summary of delineation activities on Railroad Spur A may be found in the Human Health Risk Assessment for the Railroad Spurs (BBL, 2004). Figure D-7 presents delineation locations at Railroad Spur A, and Table D-1 presents a summary of soil analytical results from samples collected along Railroad Spur A.

Abramson Property

Sampling activities have been conducted on the Abramson property since April 1993 to investigate the extent of OCPs in soil. In September 1993, soil samples were collected in the primary man-made drainage channel on the property. In November 1998, samples were taken from the soil surface in the southwest portion of the property, in the primary man-made drainage channel, and in the northern portion of the property.

An investigation of offsite soil at the Abramson property was conducted in November 2000, October 2001, and January 2002 to complete delineation of COCs detected in previous investigations. Horizontal and vertical delineation was achieved as a result of the investigation activities. Horizontal delineation was achieved in surface soil (0 to 0.5 feet bgs) to the north, south, and east. Horizontal delineation of the western portion of the Abramson property is complete on adjacent properties located to the west. Vertical delineation was achieved across the Abramson property at depths ranging from 1 to 3 feet bgs.

A summary of delineation activities may be found in the Abramson Property Soil Delineation Report (BBL, 2002). Figures D-8 and D-9 present horizontal and vertical delineation locations on the Abramson property, respectively.

Surface Water

Surface water bodies in the vicinity of the Site include the Unnamed Tributary and the retention pond at the USD facility. There are drainage ditches onsite and offsite but they only convey stormwater and surface water runoff episodically during and after precipitation events and are not considered surface water bodies.

Surface water impacts have been investigated in the vicinity of the Site and are summarized below.

Culvert Channel/Unnamed Tributary

A Remedial Investigation (RI) was conducted for surface water in March and May 2003 and July 2004 in the Culvert Channel and Unnamed Tributary to assess the presence of OCPs. Surface water samples were collected from two transects on the Culvert Channel and eight transects on the Unnamed Tributary.

Surface water samples collected in the Culvert Channel contained concentrations of 4,4'-DDE and dieldrin greater than the NJDEP Surface Water Quality Standards (SWQS) for fresh water. However, the OCP concentrations detected in these samples seem to be attributed to suspended particles within the samples, likely resulting from disturbance during sampling procedures, and are not representative of surface water conditions. Surface water samples collected in the Unnamed Tributary upstream and downstream of the confluence with the Culvert Channel did not contain detected concentrations of OCPs. A summary of sampling activities may be found in the Unnamed Tributary Remedial Investigation Report/Baseline Ecological Evaluation/Baseline Ecological Risk Assessment (RIR/BEE/BERA; BBL, 2005). Figure E-1 presents sample locations in the Unnamed Tributary.

USD Facility

Surface water samples were collected 1995 from the retention pond at the USD facility. Concentrations of OCPs in pond surface water samples were below SWQS. Results of the 1995 surface water sampling were presented in the Offsite Soils Remedial Investigation Summary Report for Project Activities Performed April 1992 – March 1995 (Foster Wheeler, 1995).

Sediment

Sediment impacts have been investigated at offsite properties in the vicinity of the Site. Sediment analytical results indicate the presence of OCPs. OCPs detected at concentrations greater than the NJDEP SCC include alpha-BHC, beta-BHC, chlordane, 4,4'-DDD, and dieldrin.

Culvert Channel/Unnamed Tributary

Erodible soil sampling conducted during the 1993 Abramson property drainage channel investigation included locations where stormwater exits the Abramson property south of the Metuchen Road Culvert, and discharges to the Culvert Channel at the Lehigh Valley Culvert.

In 2001, sediment samples were collected from the Metuchen Road Culvert and Lehigh Valley Culvert, and analyzed for OCPs. OCPs were detected in sediment samples collected at each of these locations at concentrations greater than the SCC.

A Remedial Investigation (RI) was conducted for sediment in March and May 2003 and July 2004 in the Culvert Channel and Unnamed Tributary to assess the presence of OCPs. Sediment samples were collected from two transects on the Culvert Channel and eight transects on the Unnamed Tributary. The sediment samples contained 4,4'-DDD, chlordane, and dieldrin at concentrations greater than the SCC. A summary of sampling activities may be found in the Unnamed Tributary RIR/BEE/BERA (BBL, 2005). Figure E-1 presents sample locations in the Unnamed Tributary. Figures E-2 and E-3 present trends for the most frequently detected OCP (i.e., chlordane, 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE) in surface (i.e., 0-to-6 inches) and subsurface (i.e., greater than 6 inches, taken as an average) sediment, respectively, in the Culvert Channel to the confluence of the Unnamed Tributary and Bound Brook (i.e., T6A to T12). Figures E-4 and E-5 present trends for the most frequently detected OCP (i.e., chlordane, 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE) in surface (i.e., 0-6 inches) and subsurface (i.e., greater than 6 inches, taken as an average) sediment, respectively, in the Unnamed Tributary from T4 to T12.

United Steel Deck Facility

Sediment samples were collected in 1995 from the retention pond at the USD facility. Ten sediment samples collected from the interior of the retention pond had concentrations below the current SCC. Alpha-BHC, beta-BHC, and chlordane were detected above the SCC in the pond sediment sample at the outlet of the pond. Results of the 1995 sediment sampling were presented in the Off-Site Soils Remedial Investigation Summary Report for Project Activities Performed April 1992 – March 1995 (Foster Wheeler, 1995).

Railroad Spur A

As part of the 1995 investigation of Railroad Spur A, one sediment sample was also collected in the stream leading away from the USD detention pond. In 2003, one vertical delineation sample was collected from 1.5 to 2 feet bgs and indicated no detections of OCPs. A summary of delineation activities on Railroad Spur A may be found in the Human Health Risk Assessment for the Railroad Spurs (BBL, 2004).

Air (Outdoors)

Constituents found in surface soil do not meet the United States Environmental Protection Agency (USEPA) volatilization requirements (USEPA, 1991) for both the Henry's Law constant (greater than or equal to 1×10^{-5} atm-m³/mole) and molecular weight (less than 200 g/mol). The surface soil impacts are not expected volatilize substantially. The physical setting of the Site and adjacent properties effectively controls fugitive dust (e.g., vegetative cover, asphalt, concrete). Potential impacts related to fugitive dust are discussed under the Surface/Subsurface Soil section. Therefore, outdoor air is not considered to be an impacted media.

References

BBL Environmental Services, Inc. December 1999. *Quarterly Sampling and Monitoring Report for the Groundwater Treatment System (February 1999 through April 1999)*.

BBL Environmental Services, Inc. January 2000. *Quarterly Sampling and Monitoring Report for the Groundwater Treatment System (May 1999 through September 1999)*.

BBL Environmental Services, Inc. March 2000. *Abramson Property Investigation Report.*

BBL Environmental Services, Inc. April 2001. *Supplemental Remedial Investigation Work Plan*

BBL Environmental Services, Inc. June 2001. *Abramson Property Baseline Ecological Evaluation.*

BBL Environmental Services, Inc. June 2001. *Hydrogeologic Assessment Report.*

BBL Environmental Services, Inc. April 2001. *Supplemental Remedial Investigation Work Plan.*

BBL Environmental Services, Inc. February 2002. *Response to NJDEP Comments Dated July 26, 2001 and August 23, 2001.*

Blasland, Bouck & Lee, Inc. March 2002. *Abramson Property Soil Delineation Report.*

Blasland, Bouck & Lee, Inc. March 2002. *Supplemental Remedial Investigation Report.*

Blasland, Bouck & Lee, Inc. March 2002. *Supplemental Remedial Investigation Work Plan for Off-Site Soil.*

Blasland, Bouck & Lee, Inc. September 2002. *Abramson Property Baseline Ecological Risk Assessment.*

Blasland, Bouck & Lee, Inc. September 2002. *Interim Remedial Action Work Plan.*

Blasland, Bouck & Lee, Inc. November 2002. *Resolution of Soil Delineation for Chlordane.*

Blasland, Bouck & Lee, Inc. November 2002. *Recent Groundwater Monitoring Results (Second, Third, and Fourth Quarter 2001, First, Second, and Third Quarter 2002).*

Blasland, Bouck & Lee, Inc. November 2002. *Site- Specific Low Flow Groundwater Sampling and Analysis Plan.*

Blasland, Bouck & Lee, Inc. November 2002. *Chlordane Soil Delineation Plan.*

Blasland, Bouck & Lee, Inc. January 2003. *Fourth Quarter 2002 Groundwater Monitoring Event Results.*

Blasland, Bouck & Lee, Inc. January 2003. *Response to NJDEP Comment Letter Received on October 18, 2002.*

Blasland, Bouck & Lee, Inc. April 2003. *Semi-Annual Groundwater Monitoring Report (Fourth Quarter 2002 and First Quarter 2003).*

Blasland, Bouck & Lee, Inc. May 2003. *Supplemental Remedial Investigation Work Plan – Offsite Soils.*

Blasland, Bouck & Lee, Inc. June 2003. *Response to NJDEP Comment Letters Dated March 18, 2003 and April 29, 2003.*

Blasland, Bouck & Lee, Inc. July 2003. *Addendum to the Supplemental Remedial Investigation Report.*

Blasland, Bouck & Lee, Inc. July 2003. *Second Quarter 2003 Groundwater Monitoring Event Results.*

Blasland, Bouck & Lee, Inc. July 2003. *Groundwater Sampling Clarifying Responses to ChevronTexaco's June 13, 2003 Submittal.*

Blasland, Bouck & Lee, Inc. November 2003. *Semi-Annual Groundwater Monitoring Report (Second Quarter 2003 and Third Quarter 2003).*

Blasland, Bouck & Lee, Inc. April 2004. *Abramson Property Baseline Ecological Risk Assessment Addendum.*

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Abramson Property.*

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Railroad Spurs.*

Blasland, Bouck & Lee, Inc. August 2004. *First Semi-Annual Groundwater Monitoring Report for 2004.*

Blasland, Bouck & Lee, Inc. March 2005. *Human Health Risk Assessment Report for the Facility Perimeter.*

Blasland, Bouck & Lee, Inc. March 2005. *Interim Remedial Action Report.*

Blasland, Bouck & Lee, Inc. April 2005. *Second Semi-Annual Groundwater Monitoring Report for 2004.*

Blasland, Bouck & Lee, Inc. May 2005. *Human Health Risk Assessment Report for the Culvert Channel and Unnamed Tributary.*

Blasland, Bouck & Lee, Inc. May 2005. *Unnamed Tributary Remedial Investigation Report/Baseline Ecological Evaluation/Baseline Ecological Risk Assessment.*

Blasland, Bouck & Lee, Inc. 2005. *Draft Supplemental Remedial Investigation Report/Remedial Action Selection Report for the Hummel Property.*

Blasland, Bouck & Lee, Inc. 2005. *Draft Supplemental Remedial Investigation Report/Remedial Action Selection Report for the United Steel Deck Property.*

Chevron. June 1990. *Results of Sampling Program and "At Risk" Cleanup Plan*

Chevron. November 1990. *Results of Sampling Program and "At Risk" Cleanup Plan*

Dames & Moore. January 1990. *Sampling Plan Results – Soils.*

Dames & Moore. August 1991. *Results of Additional Sampling.*

Dames & Moore. January 1992. *Results of Additional Sampling.*

Ebasco Environmental Corp. February 1992. *Contaminated Soil Delineation and Excavation Sampling Plan.*

Ebasco Environmental Corp. February 1992. *Preliminary Groundwater Cleanup Plan.*

Ebasco Environmental Corp. February 1992. *Soil Cleanup Plan for the Southern Portion of the Hummel Chemical Property.*

Ebasco Environmental Corp. May 1992. *Contaminated Soil Delineation and Excavation Sampling Plan Amendment.*

Ebasco Environmental Corp. May 1992. *Hummel Pre-Excavation Sampling and Analysis Summary Report.*

Ebasco Environmental Corp. May 1992. *Semi-Annual Groundwater Sampling Report June/July 1992 Sampling Results.*

Ebasco Environmental Corp. June 1992. *Chevron Pre-Excavation Sampling and Analysis Summary Report.*

Ebasco Environmental Corp. October 1992. *Response Document Addressing Comments made in the NJDEP Letter of 12/31/91.*

Ebasco Environmental Corp. October 1992. *Semi-Annual Groundwater Sampling Report June/July 1992 Sampling Results.*

Ebasco Environmental Corp. November 1992. *Contaminated Soil Delineation and Excavation Sampling Plan Amendment. No. 2.*

Ebasco Environmental Corp. November 1992. *Preliminary Groundwater Cleanup Plan Addendum*

Ebasco Environmental Corp. January 1993. *Geophysical Survey Report.*

Ebasco Environmental Corp. February 1993. *Hummel Croton Chemical Co., Remedial Action Report.*

Ebasco Environmental Corp. February 1993. *Preliminary Ecological Risk Characterization.*

Ebasco Environmental Corp. February 1993. *Site Characterization Soil Sampling and Analytical Summary Report.*

Ebasco Environmental Corp. February 1993. *Well Installation & Pump Test Report.*

Ebasco Environmental Corp. June 1993. *Soil Sampling Plan Amendment No. 1 to the Soil Cleanup Plan for the Southern Portion of the Hummel Chemical Property.*

Ebasco Environmental Corp. September 1993. *NJDEP Groundwater Discharge Permit Application.*

Ebasco Environmental Corp. September 1993. *Semi-Annual Groundwater Sampling Report.*

Ebasco Environmental Corp. November 1993. *Freshwater Wetlands Permit Application Chevron Chemical Co. South Plainfield Site Block 255, Lot 30.*

Ebasco Environmental Corp. January 1994. *Semi-Annual Groundwater Sampling Report Dec. 1993 Sampling Reports.*

Ebasco Environmental Corp. *Phase II Remedial Action Report.*

Enserch Environmental Corp. January 1994. *Soils Remedial Investigation/Remedial Actions Summary Report for Project Activities Performed March 199 through May 1993*

Enserch Environmental Corp. May 1994. *Groundwater Generation and Discharge to the Middlesex County Utilities Authority Activities Report.*

Enserch Environmental Corp. May 1994. *Groundwater Remedial Investigations Summary Report for Activities performed Feb. 1992 - April 1994.*

Enserch Environmental Corp. June 1994. *Sediment Sampling and Analytical Report.*

Enserch Environmental Corp. July 1994. *Semi-Annual Groundwater Sampling Report Dec. 1993 Sampling Reports.*

Enserch Environmental Corp. July 1994. *Soils Remedial Investigation/Remedial Actions Summary Report for Project Activities Performed Mar. 1992 - May 1993.*

Foster Wheeler Environmental Corp. November 1994. *Final Responses to the NJDEP Comment Letter Dated. 11/30/93, 3/18/94, 7/22/94, 10/18/94, Contract No. TS-226.*

Foster Wheeler Environmental Corp. January 1995. *Mid 1994 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. April 1995. *Semi-Annual Groundwater Sampling Report June 1993 Sampling Results*

Foster Wheeler Environmental Corp. April 1995. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System.*

Foster Wheeler Environmental Corp. June 1995. *End 1994 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. July 1995. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Feb. - April 1995).*

Foster Wheeler Environmental Corp. September 1995. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System. (May 1995 - July 1995)*

Foster Wheeler Environmental Corp. October 1995. *Mid 1995 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. December 1995. *Offsite Soils Remedial Investigation Summary Report for Project Activities Performed April 1992 - Mar. 1995.*

Foster Wheeler Environmental Corp. December 1995. *Responses to the NJDEP Comment Letter Dated 10/13/95.*

Foster Wheeler Environmental Corp. January 1996. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Aug. 1995 – Oct. 1995).*

Foster Wheeler Environmental Corp. April 1996. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Nov. 1995 – Jan., 1996.*

Foster Wheeler Environmental Corp. June 1996. *Beginning 1996 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. July 1996. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Feb. 1996 - April 1996).*

Foster Wheeler Environmental Corp. September 1996. *Waste Characterization Sampling and Analysis Summary Report.*

Foster Wheeler Environmental Corp. October 1996. *Mid 1996 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. October 1996. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (May 1996 - July 1996).*

Foster Wheeler Environmental Corp. December 1996. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Aug. 1996 - Oct. 1996).*

Foster Wheeler Environmental Corp. April 1997. *Jan. 1997 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. May 1997. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Nov. 1996 - Jan. 1997).*

Foster Wheeler Environmental Corp. July 1997. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Feb. 1997 - April 1997).*

Foster Wheeler Environmental Corp. October 1997. *Addendum to the 1995 Off-Site Soils Remedial Investigation Summary Report for Projects Activities Performed March and June 1997.*

Foster Wheeler Environmental Corp. October 1997. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (May 1997 - July 1997).*

Foster Wheeler Environmental Corp. November 1997. *June/July 1997 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. January 1998. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Aug. 1997 - Oct. 1997).*

Foster Wheeler Environmental Corp. May 1998. *Groundwater Modeling Report for the Revised Groundwater Treatment System*

Foster Wheeler Environmental Corp. May 1998. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Nov. 1997 - Jan. 1998).*

Foster Wheeler Environmental Corp. May 1998. *Work Plan for Abramson Property Investigative Sampling.*

Foster Wheeler Environmental Corp. June 1998. *January 1998 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. July 1998. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Feb. 1998 - April 1998).*

Foster Wheeler Environmental Corp. November 1998. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (May 1998 - July 1998).*

Foster Wheeler Environmental Corp. February 1999. *Addendum No.2 to the 1995 Off-Site Soils Remedial Investigation Summary Report for Projects Activities Performed March 1997 & Sept/Nov 1998.*

Foster Wheeler Environmental Corp. February 1999. *July 1998 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. February 1999. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Aug. 1998 - Oct. 1998).*

Foster Wheeler Environmental Corp. June 1999. *Jan. 1999 Semi-Annual Groundwater Sampling and Analysis Report.*

Foster Wheeler Environmental Corp. June 1999. *Quarterly Groundwater Sampling and Monitoring Report for the Groundwater Treatment System (Nov. 1998 - Jan 1999).*

React Environmental Engineers. March 1991. *Decontamination of a Pesticide Formulation Facility.*

May 1980. *Chevron Phase I Site Groundwater Protection Plan.*

June 1988. *Chevron Sampling Plan.*

3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food ³
Groundwater	No	No	No	No	–	–	No
Air (indoor)	NI	NI	NI	–	–	–	–
Surface Soil (e.g. < 2 ft)	No	Yes	No	Yes	Yes	No	No
Surface Water	No	No	–	–	Yes	Yes	Yes
Sediment	No	No	–	–	Yes	Yes	Yes
Subsurface Soil (e.g., > 2	–	–	–	Yes	–	–	No
Air (outdoors)	NI	NI	NI	NI	NI	–	–

Note: NI = Media not impacted

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes (“-”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

Rationale

Groundwater

Residents

A complete pathway is not expected under current conditions between residents and impacted groundwater because the groundwater plume is generally limited to the Site and no residential wells exist in this area. The Site is located in an area zoned for industrial/manufacturing/commercial land use. Well searches were completed in 1999 and 2004 which indicated that no residential wells exist in the immediate vicinity of the Site.

Workers

A complete pathway is not expected under current conditions between on-site workers and impacted groundwater because the facility is no longer in operation and there are no current uses of groundwater or potential exposure pathways.

Exposure to groundwater by off-site workers is not expected because: 1) there is no use of groundwater at the adjacent facilities, and 2) excavations on Hummel and United Steel Deck would have to be performed by Occupational Safety and Health Administration (OSHA)-trained personnel due to the soil impacts; therefore, any potential exposures would be mitigated by the procedures implemented by these workers.

Day Care

No day care facilities or other possibly sensitive receptors (e.g., school, hospitals) exist near groundwater impacts; therefore, a complete pathway is not expected under current conditions.

Construction

Construction activities could occur; however, these activities would be conducted at a depth shallower than the typical groundwater level at the Site making this an incomplete pathway under current conditions.

Food

No food items are produced or grown in contact with impacted groundwater; therefore, no complete pathway is expected under current conditions.

Surface/Subsurface Soil

Residents

A complete pathway is not expected under current conditions between residents and impacted soil. The Site, the Hummel facility, the USD facility, and the Railroad Spurs are located in an area zoned for industrial/manufacturing/commercial land use. The Abramson property is located in a currently undeveloped area zoned for residential land use.

Workers

A complete pathway could be expected under current conditions between workers and impacted soil onsite. The Site is inactive, and only one worker is currently present at the facility on a regular basis. This worker spends approximately 1 to 2 hours per day in the office area. The worker has no contact with surface soils and stays indoors or on impervious surfaces, therefore, there is no exposure pathway for this worker. However, landscapers are present onsite for lawn maintenance. A complete pathway is possible for these workers.

The Hummel property is an active 2.5-acre facility with approximately 1 acre paved or covered by buildings. The USD property is an active 11-acre facility of which approximately 9 acres is covered with impervious surface (asphalt paving, concrete paving, or manufacturing buildings). Activities related to operation at both facilities are conducted in areas with impervious surfaces. Workers are not currently present in the other areas in the vicinity of the Site (e.g., Abramson property, Railroad Spurs).

Day Care

No day care facilities or other possibly sensitive receptors (e.g., school, hospitals) exist near soil impacts; therefore, a complete pathway is not expected under current conditions.

Construction

Construction activities could occur at the Site, the Hummel facility, the USD facility, or the Railroad Spurs; therefore, this is considered to be a potentially complete pathway under current conditions.

Trespassers

A complete pathway is not expected under current conditions between trespassers and impacted soil in the interior of the Site. The interior of the Site is completely surrounded by a well-maintained and secure fence (Figure A-2). Relatively small Site areas occur outside of the fence, primarily along the western property boundary adjacent to Harmich Road. A fence also exists around the majority of the Hummel and United Steel Deck properties; therefore, trespassers are not expected under current conditions on this property. Access to these active properties is further restricted by the presence of employees during working hours. Trespass on these properties is also limited because the existing fences are sufficient to prevent through traffic across the properties.

A complete pathway could be reasonably expected under current conditions between trespassers and impacted soil in the following areas, which are located outside of the facility fenceline:

- Site perimeter (outside of fence);
- Abramson property; and
- Railroad Spurs.

Recreational Users

A complete pathway is not expected under current conditions between recreational users and impacted soil at

the Site. The majority of the Site is surrounded by a well-maintained and secure fence. A fence also exists around the majority of the Hummel facility; therefore, recreational users are not expected under current conditions on this property. Although a fence does not prevent recreational users from entering the USD facility, the facility is active and under the supervision of onsite workers. In addition, an inspection of the USD facility has not provided evidence of recreational users being present under current conditions. Based on inspections of the Site perimeter, the Abramson Property, and the Railroad Spurs, no evidence was observed of recreational users being present under current conditions.

Food

No food items are produced or grown in contact with impacted soil in the vicinity of the Site; therefore, no complete pathway is expected under current conditions.

Surface Water

Residents

No complete pathway is expected under current conditions between residents and impacted surface water. The Abramson property and the Unnamed Tributary are located in a currently undeveloped area zoned for industrial and/or residential land use.

Workers

No complete pathway is expected under current conditions between workers and impacted surface water. The off-site worker is not a receptor of concern for the Culvert Channel and Unnamed Tributary. Photos included in Attachment 1 of the culverts illustrate the overgrowth and inaccessibility of these areas. It does not appear that these areas are maintained, nor has CEMC ever observed evidence of city workers performing maintenance activities on the culvert. This area is located in a currently undeveloped area zoned for industrial and/or residential land use.

Trespassers

Based on observations during investigations, trespassers may traverse the water bodies en route to other areas or while recreating. A complete pathway could be reasonably expected under current conditions between trespassers and impacted surface water in the Unnamed Tributary.

Recreational Users

Because the Unnamed Tributary and Culvert Channel are shallow (i.e., water depth generally is 2 feet or less), most forms of primary and secondary contact recreation, such as swimming, diving, and boating, cannot be supported. For similar reasons, as well as the fishing advisories currently in place, these drainage features are not anticipated to attract anglers. Therefore, potential contact recreation in the Unnamed Tributary and Culvert Channel is likely limited to wading. A complete pathway could be reasonably expected under current conditions between recreational users and impacted surface water in the Unnamed Tributary/Culvert Channel.

Food

Fish in the Unnamed Tributary may come in contact with impacted surface water; therefore, complete pathway could be reasonably expected under current conditions between food items and surface water impacts. However, as discussed in the next section, a fishing advisory is in place on the Bound Brook and fish consumption is prohibited.

Sediment

Residents

No complete pathway is expected under current conditions between residents and impacted sediment. The Unnamed Tributary is located in a currently undeveloped area zoned for industrial and/or residential land use. The detention pond at the USD facility is located in an area zoned for industrial/manufacturing/commercial land use.

Workers

No complete pathway is expected under current conditions between workers and impacted sediment. The off-site worker is not a receptor of concern for the Culvert Channel and Unnamed Tributary. Photos included in Attachment 1 of the culverts illustrate the overgrowth and inaccessibility of these areas. It does not appear that these areas are maintained, nor has CEMC ever observed evidence of city workers performing maintenance activities on the culvert.

This area is located in a currently undeveloped area zoned for industrial and/or residential land use.

Trespassers

A complete pathway could be reasonably expected under current conditions between trespassers and impacted sediment in the Unnamed Tributary. Visits to the area during investigation activities identified visible signs of activity, and there is potential for trespass based on trash and other debris observed. Tire tracks on a path in area of the Unnamed Tributary suggest a route used by trespassers riding all terrain vehicles (ATVs) or dirt bikes to connect to areas south of the Bound Brook.

Recreational Users

A complete pathway could be reasonably expected under current conditions between recreational users and impacted sediment in the Unnamed Tributary. Because the Unnamed Tributary and Culvert Channel are shallow (i.e., water depth generally is two feet or less), most forms of primary and secondary contact recreation, such as swimming, diving, and boating, cannot be supported. For similar reasons, as well as the fishing advisories currently in place, these drainage features are not anticipated to attract anglers. Therefore, potential contact recreation in the Unnamed Tributary and Culvert Channel is likely limited to wading. Although a fence does not prevent recreational users from entering the detention pond at USD facility, the facility is active and under the supervision of onsite workers. In addition, an inspection of the USD facility has not provided evidence of recreational users being present under current conditions.

Food

Fish in the Unnamed Tributary may come in contact with impacted sediment; therefore, complete pathway could be reasonably expected under current conditions between food items and surface water impacts.

References

BBL Environmental Services, Inc. June 2001. *Abramson Property Baseline Ecological Evaluation*.

Blasland, Bouck & Lee, Inc. September 2002. *Abramson Property Baseline Ecological Risk Assessment*.

Blasland, Bouck & Lee, Inc. April 2004. *Abramson Property Baseline Ecological Risk Assessment Addendum*.

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Abramson Property*.

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Railroad Spurs*.

Blasland, Bouck & Lee, Inc. March 2005. *Human Health Risk Assessment Report for the Facility Perimeter*.

Blasland, Bouck & Lee, Inc. May 2005. *Human Health Risk Assessment Report for the Culvert Channel and Unnamed Tributary*.

Blasland, Bouck & Lee, Inc. May 2005. *Unnamed Tributary Remedial Investigation Report/Baseline Ecological Evaluation/Baseline Ecological Risk Assessment*.

Email correspondence between Andrew Park, USEPA, and Ellen M. Haggerty, Blasland, Bouck & Lee, Inc. September 1, 2005. *Re: Chevron, South Plainfield, NJ - Human EI (CA725)*.

-
4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**^t (i.e., potentially “unacceptable”) because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks?

_____ If no (exposures cannot be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

X If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

_____ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code.

Rationale

Surface/Subsurface Soil

Workers and Impacted Soil

A complete exposure pathway could be reasonably expected under current conditions between onsite landscaping workers and impacted soil at the Site. During landscaping activities, some exposure to impacted soil could be reasonably expected. This exposure is not reasonably expected to be “significant” because the landscape workers are present on the facility every two weeks from early May to early November, or approximately 11 days per year, which is less than the assumed frequency of trespass on the site of 52 days per year. A quantitative evaluation of exposure to trespassers is discussed in the following section, and is considered protective for both receptors. Additionally, due to the well vegetated surface where landscaping activities occur, there is little potential for dust generation or dermal contact with soil by landscaping workers. Furthermore, landscaping onsite is limited to the perimeter and western portion of the facility where the surface soil concentrations are significantly less than in the former process areas. There is no onsite worker contact with the areas of higher concentrations because the grass in those portions of the facility is no longer mowed. Therefore, the exposure pathway of onsite workers and impacted soil is not expected to be “significant”.

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a Human Health Risk Assessment specialist with appropriate education, training, and experience.



Construction Workers and Impacted Soil

A complete exposure pathway could be reasonably expected under current conditions between construction workers and impacted soil at the Site, the Hummel facility, the USD facility, and the Railroad Spurs. If construction activities were to occur, some exposure to impacted soil could be reasonably expected. These exposures are not reasonably expected to be “significant” because the duration of these exposures is anticipated to be low. These exposures are also not expected to be “significant” due to the use of appropriate controls (e.g., engineering, administrative, personal protective equipment) during construction to effectively decrease exposure to impacted soil.

Trespassers and Impacted Soil at the Site Perimeter

A complete exposure pathway could be reasonably expected under current conditions between trespassers and impacted soil at the Site perimeter. Potential human receptors in this urban industrial setting are adults and adolescents/teenagers who may walk along the perimeter of the Site or trespass on the unfenced portion of the Site. Potentially complete exposure pathways retained for quantitative evaluation include incidental ingestion, dermal contact, and inhalation of constituents of potential concern (COPC) in fugitive dust emissions from soil. This exposure is potentially “significant”. However, as discussed in the following sections, calculated risk for potential trespassers is within the USEPA’s range of acceptable values.

Trespassers and Impacted Soil at the Abramson Property

A complete exposure pathway could be reasonably expected under current conditions between trespassers and impacted soil at the Abramson property. Potential onsite human receptors are limited to adults and adolescents/teenagers who may trespass onto the property. Potentially complete exposure pathways retained for quantitative evaluation include incidental ingestion of soil and dermal contact with COPCs in soil. This exposure is potentially “significant”. However, as discussed in the following sections, calculated risk for potential trespassers is within USEPA’s range of acceptable values.

Trespassers and Impacted Soil at the Railroad Spurs

A complete exposure pathway could be reasonably expected under current conditions between trespassers and impacted soil at the Railroad Spurs. Potential onsite human receptors are limited to adults and adolescents/teenagers who may trespass in the railroad corridors. Potentially complete exposure pathways retained for quantitative evaluation include incidental ingestion of soil, dermal contact with COPC in soil, and inhalation of fugitive dusts. This exposure is potentially “significant”. However, as discussed in the following sections, calculated risk for potential trespassers is within the USEPA’s range of acceptable values.

Surface Water/Sediment

Trespassers/Recreational Users and Impacted Surface Water/Sediment in the Unnamed Tributary

A complete exposure pathway could be reasonably expected under current conditions between trespassers and impacted surfacewater at the Unnamed Tributary. Potential human receptors are limited to adults and adolescents/teenagers who may trespass in the areas surrounding the two water bodies and may cross them

while recreating. Potentially complete exposure pathways retained for quantitative evaluation include incidental ingestion and dermal contact with COPC in surfacewater and sediment. This exposure is potentially “significant”. However, as discussed in the following sections, calculated risk for potential trespassers is within the USEPA’s range of acceptable values.

Food Items and Impacted Surface Water/Sediment in the Unnamed Tributary

A complete exposure pathway could be reasonably expected under current conditions between food items (fish) and impacted surfacewater at the Unnamed Tributary. The NJDEP has not listed designated uses specifically for the Unnamed Tributary or the Culvert Channel. However, designated uses for surface water bodies may be inferred from the surface water body into which the unclassified water body flows (NJDEP, 2003). The Bound Brook and its tributaries are classified as a FW-2 Nontrout waterbody (fresh waters not designated as Outstanding National Resource waters and which do not support trout production or maintenance) in the Study Area.

According to the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9-4.15 [NJDEP, 2003]), the designated uses for FW-2 Nontrout waters include:

- maintenance, migration, and propagation of the natural and established biota;
- primary and secondary contact recreation;
- industrial and agricultural water supply;
- public potable water supply after conventional filtration treatment and disinfection; and
- any other reasonable uses.

Fishing advisories for the entire Bound Brook and its tributaries have been issued by the USEPA and the NJDEP since August 1998 due to polychlorinated biphenyls (PCBs) in fish tissue (NJDEP, 2000). Although the designated uses of these drainage features include fishing, no consumption of fish caught in these drainage features is assumed to occur currently; therefore, these exposures are not reasonably expected to be “significant” or “unacceptable”.

References

BBL Environmental Services, Inc. June 2001. *Abramson Property Baseline Ecological Evaluation*.

Blasland, Bouck & Lee, Inc. September 2002. *Abramson Property Baseline Ecological Risk Assessment*.

Blasland, Bouck & Lee, Inc. April 2004. *Abramson Property Baseline Ecological Risk Assessment Addendum*.

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Abramson Property*.

Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Railroad Spurs*.

Blasland, Bouck & Lee, Inc. March 2005. *Human Health Risk Assessment Report for the Facility Perimeter*.

Blasland, Bouck & Lee, Inc. May 2005. *Human Health Risk Assessment Report for the Culvert Channel and Unnamed Tributary.*

Blasland, Bouck & Lee, Inc. May 2005. *Unnamed Tributary Remedial Investigation Report/Baseline Ecological Evaluation/Baseline Ecological Risk Assessment.*

5. Can the “significant” **exposures** (identified in #4) be shown to be within acceptable limits?

 X If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

 If no (there are current exposures that can be reasonably expected to be “unacceptable”) - continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

 If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

Surface/Subsurface Soil

Trespassers and Impacted Soil at the Site Perimeter

Surface soil data collected during soil investigations conducted at the Site and along the perimeter of the Site in 1992, 2001, 2002, and 2003 were used to complete a Human Health Risk Assessment (HHRA, [BBL, 2005]). COPC were identified by comparing the maximum detected analytical result for each constituent to the NJDEP SCC. Constituents for which criteria were unavailable were evaluated using surrogate criteria. The COPC retained for analysis were arsenic, chlordane, DDT, dieldrin, heptachlor epoxide and toxaphene.

The RME incremental lifetime cancer risk (ILCR) estimated for an adolescent trespasser/pedestrian present on the Site perimeter along Harmich and Metuchen Roads is approximately three in one million (3×10^{-6}), and for an adult trespasser/pedestrian, the potential risk is approximately two in one million (2×10^{-6}). Potential carcinogenic risks along the western Site perimeter are at the low end of the acceptable risk range (one in one million to one in ten thousand, or 1×10^{-6} to 1×10^{-4}) discussed by the National Contingency Plan and presented in the USEPA’s *Risk Assessment Guidance for Superfund* (USEPA, 1989; 1990; 2001a). The RME hazard index (HI) for an adolescent trespasser/pedestrian present on the Site perimeter along Metuchen and Harmich Roads in 0.04, and for an adult trespasser/pedestrian is 0.01. RME non-carcinogenic HI for both receptors on the Site perimeter along Metuchen and Harmich Roads are less than the USEPA target HI of one. Based on the HHRA, these exposures are within acceptable limits.⁵

Trespassers and Impacted Soil at the Abramson Property

Surface soil data collected during soil investigations conducted on the property from 1998 to 2003 were used to complete a HHRA (BBL, 2004). Results from the 1993 sampling event were not included in this assessment, due to questionable data quality. COPC were identified by comparing the maximum detected analytical result for each constituent to NJDEP SCC. Constituents for which criteria were unavailable were evaluated using

⁵ ILCR and HI values cited here vary slightly from those presented in the HHRA (BBL, 2005). Values cited here are based on recalculated risks using more conservative, EPA-approved exposure assumptions.

surrogate criteria. The COPC retained for analysis were 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane, dieldrin, **heptachlor, and heptachlor epoxide.**

The RME incremental lifetime cancer risk (ILCR) estimated for an adolescent trespasser/pedestrian present on the Abramson Property is approximately three in one million (3×10^{-6}), and for an adult trespasser/pedestrian, the potential risk is approximately two in one million (2×10^{-6}). Overall Site carcinogenic risks are within the range of acceptable risks (1 in 1 million to 1 in 10 thousand, or 1×10^{-6} to 1×10^{-4}) discussed by the national Contingency Plan and presented in the USEPA's *Risk Assessment Guidance for Superfund* (USEPA, 1989, 1998). Estimated cumulative risks for adolescent and adult trespassers for all COPCs, both individually and cumulatively, are at the low end of the USEPA target risk range. The RME hazard index (HI) for an adolescent trespasser/pedestrian present on the Abramson Property is 0.09, and for an adult trespasser/pedestrian is 0.03. Route-specific hazard quotients (HQs) and receptor HIs are less than the acceptable target of 1 recommended by the USEPA (1989). Based on the HHRA, these exposures are within acceptable limits.⁵

Trespassers and Impacted Soil at the Railroad Spurs

Surface soil data collected during investigations conducted on the Railroad Spurs from 1992 to 2002 were used to complete a HHRA (BBL, 2004). COPC were identified by comparing the maximum detected analytical result for each constituent detected in soils on the Railroad Spurs to NJDEP SCC. Constituents for which no criteria were available were evaluated using surrogate criteria. The COPC retained for analysis were aldrin, arsenic, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, chlordane, DDD, DDE, DDT, dieldrin, heptachlor, heptachlor epoxide, and toxaphene.

The incremental lifetime cancer risk (ILCR) estimated for both adolescent and adult trespassers on Railroad Spur A is approximately two in one hundred thousand (2×10^{-5}). The HI for an adolescent trespasser on Railroad Spur A is 0.3, and for an adult trespasser is 0.1. The ILCR estimated for both adolescent and adult trespassers on Railroad Spur B is two in one hundred thousand (2×10^{-5}). Estimates for HI for the adolescent and adult trespassers on Railroad Spur B are 0.6 and 0.2, respectively.⁵

Overall carcinogenic risks along the Railroad Spurs are within the range of acceptable risks (one in one million to one in ten thousand, or 1×10^{-6} to 1×10^{-4}) discussed by the National Contingency Plan and presented in the USEPA's *Risk Assessment Guidance for Superfund* (USEPA, 1989; 1998). Estimated cumulative risks for adolescent and adult trespassers for all COPCs, both individually and cumulatively, are at the low end of the USEPA target risk range.

Reasonable maximum exposure (RME) non-carcinogenic HIs for both receptors on Railroad Spur A are less than the USEPA target of one. Potential RME carcinogenic risks for the potential adolescent trespasser associated with exposure to soil along Railroad Spur A are within the USEPA range of 1×10^{-4} to 1×10^{-6} . RME non-carcinogenic HIs for both receptors on Railroad Spur B are less than the USEPA target HI of one. Potential RME carcinogenic risks associated with exposure to soil along Railroad Spur B are within the USEPA target range of 1×10^{-4} to 1×10^{-6} . Based on the HHRA, these exposures are within acceptable limits.

Surface Water/Sediment

Trespassers/Recreational Users and Impacted Surface Water/Sediment in the Unnamed Tributary

Surface water and sediment data collected during investigations in 2001 and 2003 were to complete a HHRA (BBL, 2005). Surface water COPCs were identified by comparing the maximum detected concentration of each constituent in surface water to NJDEP SWQS. Sediment COPCs were identified by comparing the maximum detected concentration of each constituent in sediments to NJDEP SCC. Constituents for which no criteria were available were evaluated using surrogate criteria. The COPC retained for further assessment were chlordane (sediment only), DDD (sediment only), DDE (surface water only), and dieldrin.

The ILCR estimated for both adolescent and adult trespassers in the Unnamed Tributary is approximately three in ten million (3×10^{-7}). The non-carcinogenic HI for an adolescent trespasser in the Unnamed Tributary is 0.006, and for an adult trespasser is 0.002. The ILCR estimated for both adolescent and adult trespassers in the Culvert Channel is three in one million (3×10^{-6}). Estimates of HI for the adolescent and adult trespassers in the Culvert Channel are 0.05 and 0.02, respectively.⁵

Overall, carcinogenic risks in the two drainage features are lower than the range of acceptable risks (1×10^{-6} to 1×10^{-4}) discussed in the National Contingency Plan (USEPA, 1990) and presented in the USEPA's *Risk Assessment Guidance for Superfund* (USEPA, 1989; 2001a). RME non-carcinogenic HI for in the two drainage features are at least two orders of magnitude less than the USEPA target of one. Based on the HHRA, these exposures are not expected to be "unacceptable".

References

- BBL Environmental Services, Inc. June 2001. *Abramson Property Baseline Ecological Evaluation*.
- Blasland, Bouck & Lee, Inc. September 2002. *Abramson Property Baseline Ecological Risk Assessment*.
- Blasland, Bouck & Lee, Inc. April 2004. *Abramson Property Baseline Ecological Risk Assessment Addendum*.
- Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Abramson Property*.
- Blasland, Bouck & Lee, Inc. April 2004. *Human Health Risk Assessment for the Railroad Spurs*.
- Blasland, Bouck & Lee, Inc. March 2005. *Human Health Risk Assessment Report for the Facility Perimeter*.
- Blasland, Bouck & Lee, Inc. May 2005. *Human Health Risk Assessment Report for the Culvert Channel and Unnamed Tributary*.
- Blasland, Bouck & Lee, Inc. May 2005. *Unnamed Tributary Remedial Investigation Report/Baseline Ecological Evaluation/Baseline Ecological Risk Assessment*.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Former Ortho Products Facility, EPA ID# NJD002171593, located at 800 Metuchen Road in South Plainfield, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - "Current Human Exposures" are NOT "Under Control."

_____ IN - More information is needed to make a determination.

Completed by: Ellen M. Haggerty
Senior Project Engineer II/Manager
Blasland, Bouck & Lee, Inc.

Reviewed and Revised by: Kristin McKenney, Senior Risk Assessor
Jennifer Nystrom, Risk Assessor
Booz Allen Hamilton (for EPA Region 2)

Reviewed by: _____ Date: _____

Andy Park, RPM
RCRA Programs Branch
EPA Region 2

Date: _____

Barry Tornick, New Jersey Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: Original signed by: _____ Date: September 26, 2003

Adolph Everett, Chief
RCRA Programs Branch
EPA Region 2

Locations where references may be found:

EPA Region 2, RCRA Records Center, 290 Broadway, 15th Floor, NY, NY 10007-1866
NJDEP, Office of Records Custodian, Attn: Public Records Request, 401 East State Street, P.O. Box 442,
Trenton, New Jersey 08625-0422, (609) 341-3121, <http://www.nj.gov/dep/opra>
Blasland, Bouck & Lee, Inc. Cranbury office (Ellen M. Haggerty, 609-860-0590 ext. 240), emh@bbl-inc.com

Contact telephone and e-mail numbers:

EPA: Andrew Park, 212-637-4184, park.andy@epa.gov
NJDEP: Sharon Bruder, 609-633-1449, sharon.bruder@dep.state.nj.us
Chevron: Garrick Jauregui, 925-842-9040, garrick@chevron.com

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE

SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

